Extension Note
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Observations on the use of stubs by wild birds: A 10-year update

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Abstract

In British Columbia, many species of wildlife depend on dead or dying trees; however, current Workers' Compensation Board regulations require that such trees be felled. In 1990, in an effort to reconcile workers' safety with wildlife habitat needs, Pope and Talbot Limited proposed the creation of a number of tall stumps (3–5 m tall) in their logging operations. In the study cutblock, approximately 170 lodgepole pine stumps ("stubs") were cut. Since their establishment, the stubs were monitored for bird nesting each spring. A total of 86 active nests have been counted in 10 years. Ninety-five percent of this nesting occurred in stubs in the clearcut portion of the block, versus 5% in the selectively logged portion. Approximately 16% of the stubs were used for nesting at least once during the 10 years of observations. In general, the greater the diameter of the stub, the greater likelihood that it would be used for nesting. All nesting occurred in reworked holes; no new nest holes were drilled in these stubs.

Stub creation should continue to be a part of the wildlife tree management strategy in any logging operation, irrespective of the species of tree being harvested. The average density should be at least one stub per hectare, but preferably much higher to ensure that suitable nest stubs are retained. Stubs that are not used for nesting may provide perching or feeding sites, and contribute to the area's coarse woody debris when they fall. Stub creation involves little extra cost and little volume is lost. Therefore, all forest companies should be encouraged to create stubs as part of responsible forest stewardship.

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Introduction

In British Columbia, 80–90 wildlife species (woodpeckers, raptors, songbirds, mammals, and reptiles) depend on dead or dying trees for some of their life functions. However, such trees may present a hazard to forestry workers. Workers' Compensation Board regulations require that all snags (taller than 5 m), or other trees that are hazardous to workers, must be felled (WCB Health and Safety Regulations, Sections 60.14 and 60.38). Thus, a worker safety requirement in current forest management is eliminating an important wildlife habitat element.

In 1990, Pope and Talbot Limited's Midway Division proposed the creation of a number of tall stumps in a cutblock as an experiment in the retention of wildlife trees, which would comply with Workers' Compensation Board regulations. A feller-buncher was used to harvest the cutblock, but also cut a number of trees to leave 3–5 m tall stumps

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("stubs"). Safety concerns were eliminated during the harvesting because the forestry worker was protected by the machine's cab during felling. In addition, stubs of less than 5 m are not considered as dangerous to workers; therefore, no safety concerns would be raised during post-harvest silviculture operations.

I have monitored these stubs for nesting birds annually over the past 10 years. Since 1990, I have produced a one-page inventory report following my fieldwork at this site. In 1995, I reported the results at the Wildlife Tree/Stand-level Biodiversity Workshop (Harris 1995). This extension note summarizes the 10 years of observations and offers recommendations for the future of stub management.

Study Area

The study area is a 125-ha cutblock located in the Rendell Creek valley, 60 km southeast of Kelowna, B.C. This valley is situated in the Kettle dry mild Interior Douglas-fir (IDFdm1) biogeoclimatic

FIGURE 1. Feller buncher creating stubs in Boundary Forest District (Brian Harris photograph).

zone variant (Braumandl 1992). The block was a mountain pine beetle salvage cut in which all of the Douglas-fir and western larch were reserved and all stubs were created from lodgepole pine. The reserved trees were unevenly stocked; the southern one-third of the block was essentially a clearcut, while the remainder had a mixed stocking of mature and regenerating Douglas-fir and western larch. The prescription called for "up to eight stubs per hectare." As approximately 170 were created, the stocking of stubs was about 1.3 per hectare (Figure 1). The diameters of the stubs ranged from 9 to 43 cm DBH, with most between 25 and 35 cm DBH (Figure 2). All stubs were numbered and tagged in 1990 for identification and ease of monitoring.

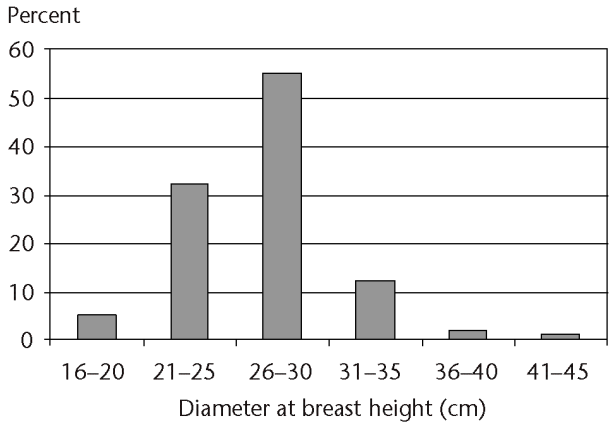

FIGURE 2. Percent of stubs available, by diameter class.

Observations

Over the 10 years of monitoring, 86 active nests in stubs have been observed in this cutblock (Table 1). Table 2 identifies 53 of the 86 active nests by bird species. Although no adults were seen in the remaining 33 nests, these were classified as "active" based on the presence of eggs, chicks, or down in the nest, or fresh woodworking around the entrance holes. Two red squirrel nests were also observed in stub holes.

The most consistent observation made was that the stubs most often selected for nesting were those in the clearcut (95%) rather than in the selectively logged portion (5%) of the study area. In this cutblock, the stubs in the selectively logged areas were very seldom chosen for nesting, regardless of their size or state of decay.

Some stubs were used for nesting repeatedly (e.g., stub #163 contained nests in 9 out of the 10 years of observations), while others were selected only occasionally. However, I could not detect any pattern as to which stubs would be used in any given year. Approximately 16% of the stubs were used for nesting at least once in 10 years. In general, the greater the diameter of the stub, the greater the likelihood that it would used for nesting (Figure 3).

TABLE 1. Number of nests and bird species[a] nesting in stubs (1991–2000)

Year	No. of nests	No. of nesting bird species
1991	9	3 (HAWO, WEBL, RBNU)
1992	4	3 (NOFL, HAWO, bluebird sp.)
1993	8	3 (MOBL, TRSW, woodpecker sp.)
1994	6	3 (NOFL, MOCH, WEBL)
1995	10	5 (NOFL, MOBL, TRSW, HAWO, woodpecker sp.)
1996	11	5 (NOFL, MOCH, AMKE, AMRO, bluebird sp.)
1997	7	2 (NOFL, AMKE)
1998	10	3 (NOFL, MOBL, woodpecker sp.)
1999	11	2 (NOFL, MOBL)
2000	10	2 (NOFL, MOBL)

[a] Abbreviations for bird species: AMKE = American kestrel; AMRO = American robin; HAWO = hairy woodpecker; MOBL = mountain bluebird; MOCH = mountain chickadee; NOFL = northern flicker; RBNU = red-breasted nuthatch; TRSW = tree swallow; WEBL = western bluebird.

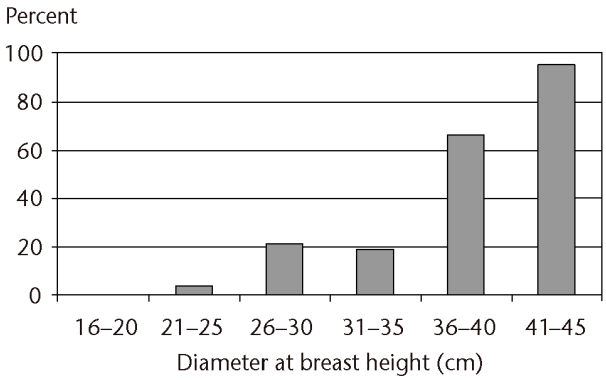

FIGURE 3. Percent of available stubs with at least one active nest.

All nesting occurred in "reworked" holes; no new nest holes appeared to be drilled in the 10 years since the stubs were cut. The stubs that were sound at the time of cutting appear still to be sound. However, after 10 years the roots of many stubs are beginning to rot and, although the stubs may still be upright, some are no longer stable. This condition was not unexpected; a local rancher stated that when used to support a fence, a rooted lodgepole pine tree cut at fence-post height would require replacement after 15 years. Stubs of tree species with greater resistance to decay, such as larch or cedar, are expected to be more long-lived.

TABLE 2. Active nests per bird species[a] (1991–2000)

Bird species	NOFL	MOBL WEBL	HAWO	TRSW	AMKE	MOCH	AMRO	RBNU
Active nests in 10 years	22	18	4	3	2	2	1	1

[a] See Table 1 for definition of bird species abbreviations.

On two occasions I observed "condo" nesting—that is, two species nesting in different holes in the same stub (northern flicker and tree swallow, and northern flicker and mountain chickadee).

The greatest diversity of nesting bird species (5) occurred in 1995 and 1996; for 1998, 1999, and 2000, I positively identified only northern flickers and bluebirds nesting in the stubs (Figure 4).

Conclusions

Wild birds began nesting in stubs in this cutblock less than 6 months after logging was completed, and some species have continued to nest in stubs over the 10 years that I have made observations.

Stubs in the clearcut portion of the block appear to be preferred for nesting over those in the selectively logged area. Potential predators, such as weasels and snakes, possibly have no cover from other predators in the clearcut, thus the nesting birds feel more secure.

Lodgepole pine stubs must have some basal defect (e.g., scars, rot, or existing woodpecker excavation) in order to be acceptable nesting substrate to cavity nesters. Trees with the appropriate characteristics must be scarce because only about 16% of the stubs have been used for nesting, even after 10 years. However, because creating stubs involves little extra cost and effort (e.g., Harris [1995] reported the loss of 0.015% of the volume for the cutblock and additional cost of $\$.01/m^3$), the lack of precise selection criteria should not argue against stubbing trees throughout a cutblock.

Stubs of less than 20 cm DBH are very seldom selected for nesting. This conclusion is based on observations of many stubs over a number of sites, although I have a record of a chickadee nest in an 18-cm stub. In this study, the larger stubs (36–45 cm DBH) were more likely to be used for nesting, even though the smaller sizes were much more available.

Recommendations

The creation of stubs should continue to be a part of the wildlife tree management strategy in any logging operation. An examination of stubs of a variety of tree species (Bennett 1992) showed that while certain types are preferred, stubs of any tree species can be used for cavity nesting or foraging.

FIGURE 4. A flicker at a nest stub in the Okanagan Highlands of Penticton Forest District (Les Gyug photograph).

Preferably, stubs should be selected from trees with defects in the lower part of the bole (particularly existing holes). This appears to be a very important characteristic for selection as nesting sites (in lodgepole pine at least).

Stubs with wildlife use characteristics, such as obvious defects or nest holes, have little value as timber and are often destroyed at the site. For instance, at many logging operations a large number of lower boles are bucked off at the landing because they are rotten or otherwise unsuitable for lumber; these are then burned in the cull pile. This wood would be better left scattered as coarse woody debris in the block or, better yet, retained as a stub to provide potential perching and nesting sites. When the stub falls, it will then add to the site's coarse woody debris. Irrespective of bird use, stubs that fall over are not "wasted"—a stub can continue to provide habitat even when it is no longer upright.

Stubs should be retained throughout the cutblock. It is clear from this research that stubs in a clearcut are not only used, but apparently preferred

to those in areas of selective logging. However, more observations are needed. For further research to take place, stubs must be available in all silviculture systems, in all slope positions, and in all locations in the block.

Stubs should be randomly spaced through the cutblock (i.e., as both groups and single stems). The average density should be at least one stub per hectare, but preferably much higher to ensure that suitable nest stubs are retained. An observation from another study suggested that birds preferred nesting in stubs where the densities approached 30 per hectare (Bennett 1994). Those stubs unsuitable for nesting may be used for feeding, perching, or courtship, as well as contribute to coarse woody debris when they fall.

Stubs have wildlife habitat value and minimal added expense is incurred, or revenue lost, in their establishment; therefore, a good case can be made for encouraging forest companies to create stubs as a part of responsible forest stewardship. Further research should be conducted to determine the most productive and cost-effective stub creation techniques for various biogeoclimatic zones and silviculture systems.

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